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REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

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PCT/DK 99/00169

International Application No.

International Filing Date 25 MARCH 1999

Patentdirektoratet

Danish Patent Office

Name of receiving Office and PCT Application

Applicant's or agent's file reference

(if desired) (12 characters maximum) IPB/26163

Box No. I TITLE OF INVENTION

A ROOF WINDOW WITH MAIN FRAME AND SASH COVERING MEMBERS

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

VELUX Industri A/S
Tobaksvejen 10
DK-2860 SØBORG
Denmark

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

Denmark

State (that is, country) of residence:

Denmark

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

HANSEN, Birgitte
Østerbrogade 177
DK-2100 COPENHAGEN Ø
Denmark

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

Denmark

State (that is, country) of residence:

Denmark

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

RAFFNSØE, Knud Rosenstand; SIMONSEN, Christian Rosendal;
NORDENBÆK, Torben; ROTNE, Jens Styru; INDAHL, Peter; SCHÖNNING,
Søren; JØRGENSEN, Bjørn Barker; BAGGER-SØRENSEN, Birgitte;
BERING, Jesper; CARLSSON, Eva; RASMUSSEN, Torben Ravn;
International Patent-Bureau
Høje Taastrup Boulevard 23, DK-2630 TAASTRUP, Denmark

Telephone No.

+45 43995511

Facsimile No.

+45 43999911

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

NIELSEN, Peter Foslund
Brede Kærs Vænge 73
DK-2635 ISHØJ
Denmark

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:
Denmark

State (that is, country) of residence:
Denmark

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

NISSEN, Kaj
Frederiksdalsvej 177
DK-2830 VIRUM
Denmark

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:
Denmark

State (that is, country) of residence:
Denmark

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

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This person is:

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☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

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☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

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- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

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Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
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- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

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- ☒ **AE** United Arab Emirates
- ☒ **ZA** South Africa
- ☐

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

RO/DK 09 APRIL 1999

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 07 April 1998 (07.04.1998)	0495/98 PA 1998 00495	Denmark		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII **INTERNATIONAL SEARCHING AUTHORITY**

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / SE

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)

Number

Country (or regional Office)

Box No. VIII **CHECK LIST; LANGUAGE OF FILING**

This international application contains the following number of sheets:

request : 4
description (excluding sequence listing part) : 10
claims : 4
abstract : 1
drawings : 4
sequence listing part of description :
Total number of sheets : 23

This international application is accompanied by the item(s) marked below:

1. ☒ fee calculation sheet and separate cheque
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☒ priority document(s) identified in Box No. VI as item(s):
From DK PA 1998 00495:
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☒ other (specify): Copy of Official Action, incl. Novelty Search Report

Figure of the drawings which should accompany the abstract: 2

Language of filing of the international application: Danish

Box No. IX **SIGNATURE OF APPLICANT OR AGENT**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

VELUX Industri A/S

Carsten Brønnum GRINVALDS

Carsten Brønnum GRINVALDS
Head of Patent Department

HANSEN, Birgitte

NIELSEN, Peter Foslund

NISSEN, Kaj

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1. Date of actual receipt of the purported international application: RO/DK 25 MARCH 1999 (25.03.99)		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA / SE	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

Date of receipt of the record copy by the International Bureau:

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Ovenlysvindue med karm- og rammebeklædningsselementer.

Opfindelsen angår et ovenlysvindue med en glasbærende rammekonstruktion sammensat af vandrette top- og bundstykker, som er forbundet gennem parallelle sidestykker, som i det mindste delvis er udformet af træprofiler, som på de udadvendende sider er dækket af vejrskærmende beklædningsselementer til tættnende indslutning af de underliggende træprofiler på alle uden for tagbelægningen liggende overflader, hvilke beklædningsselementer er forbundet med træprofilerne ved hjælp af indgrebs- og befæstigelseselementer, som er således udformet og/eller placeret i forhold til beklædningsselementerne, at indtrængning af vand og fugt til eller i træprofilerne i det væsentlige forhindres, hvorved beklædningsselementerne omfatter en hætteliggende øvre beklædningskapsel til dækning af topstykket, et indvendigt glaslisteprofil til dækning af en mod vinduets lysåbning vendende del af hvert sidestykkes overkant, et udvendigt beklædningsselement til dækning af den uden for tagfladen liggende del af hvert sidestykkes yderside og den hertil stødende del af sidestykkets overkant, og et kapselement, som overlapper glaslisteprofilet og nævnte beklædningsselement og fornedet fastgjort til sidestykkets nederste del, medens det foroven er fastholdt mod sidestykkets øverste del.

Ovenlysvinduer af denne art i såvel oplukkelig som ikke-oplukkelig udførelse er velkendte og har vundet stor udbredelse til sikring af forbedret dagslysindfald ved indretning af bygningers loftsetager til opholdsrum til bolig- og erhvervsformål.

Anvendelsen af vejrskærmende beklædningsselementer, der kan bestå af forholdsvis tynde metalpladeprofiler, f.eks. af aluminium, eller af plastprofiler tjener til at tilvejebringe en så vidt mulig fuldstændig beskyt-

telse af træprofildelene i karm- og rammekonstruktionernes top-, bund- og sidestykker.

Ved konventionelle udførelser af ovenlysvinduer er beklædningsselementerne typisk fastgjort til karm- og rammekonstruktionernes træprofildele ved hjælp af skrueforbindelser, som er ført direkte ind i de underliggende trædele, hvilket for at opnå en tilstrækkeligt nøjagtig montering dels kræver forborede skruehuller i trædelene, dels har vist sig at medføre en risiko for fugt- eller vandindtrængning i trædelene, navnlig gennem skruehullerne i beklædningsselementerne.

Ved oplukkelige ovenlysvinduer omfatter beklædningsselementerne på de udadvendende sider af karm- og rammekonstruktionernes sidestykker typisk et øvre og et nedre kapselement i forbindelse henholdsvis med karmsidestykkets øverste del over svingeaksen og med rammesidestykkets nederste del under svingeaksen, således at det nedre kapselement kan følge rammekonstruktionens udsvingning ved åbning af vinduet. I konventionelle vinduer har det for disse kapselementer vist sig vanskeligt at opnå en tilfredsstillende tætning ved overgangen mellem de øvre og nedre kapselementer, og ved den nederste ende af de nedre kapselementer.

Dette problem er søgt afhjulpet ved et fra DE-A-24 43 098 kendt ovenlysvindue, hvor beklædningsselementer er fastholdt til karm- og ramme profilerne ved indgreb med bøjler, som er fastgjort i profilerne med skruer eller søm. Denne udførelse kræver imidlertid, at beklædningsselementer monteres ved at skydes på karm- og ramme profilerne i disses længderetning.

Med opfindelsen tilsigtes det anvise et system af beklædningsselementer til et ovenlysvindue med en fuldt lukket indkapsling af karm- og ramme profilerne, samtids med at monteringsarbejdet lettes.

Til opnåelse heraf er ovenlysvinduet ifølge opfindelsen ejendommeligt ved, at kapsелеlementet ved sin øverste ende er fastholdt af nævnte øvre beklædningskapsel og ved sin nederste ende er udformet integreret med et ombukket skjult indgrebsorgan til snapindgreb med et indgrebselement fastgjort ved den nederste ende af sidestykket.

Herigennem opnås en særdeles god beskyttelse af træprofilerne mod fugtpåvirkning eller vandindtrængning, samtidigt med en lettelse af monteringsarbejdet, idet kapsелеlementet først med sin øverste ende skydes ind under den øvre beklædningskapsel og derefter med sin nederste ende forbindes med sidestykkets nederste ende ved snapindgreb.

Opfindelsen kan med fordel finde anvendelse såvel ved ikke-oplukkelige ovenlysvinduer med en i tagkonstruktionen fastliggende rammekonstruktion, som ved konventionelle oplukkelige ovenlysvinder

En foretrukken udførelse af et sådant oplukkeligt ovenlysvindue opnås ifølge opfindelsen ved, rammekonstruktionen har svingeakse parallelt med og omtrent midt imellem top- og bundstykkerne, og at nævnte kapsелеlement omfatter et øvre og et nedre kapsелеlement anbragt på hver sin side af svingeaksen, idet det øvre kapsелеlement er fastgjort til karmsidestykkets øverste del eller til en mellem karm- og rammesidestykkerne forbundet mellemrammearm, medens det nedre kapsелеlement er fastgjort til rammesidestykkets nederste del, hvilke kapsелеlementer i kort afstand fra det øvre kapsелеlements nederste ende og det nedre kapsелеlements øverste ende har befæstigelseselementer til fastgørelse til beslag i fast forbindelse henholdsvis med karmsidestykkerne eller nævnte mellemrammearme og med rammesidestykkerne, men beliggende uden for disses træprofiler.

Øvrige fordelagtige udførelsesformer for ovenlysvinduet ifølge opfindelsen og de dertil hørende beklædningselementer er angivet i underkravene.

Opfindelsen forklares i det følgende nærmere under henvisning til den skematiske tegning, hvor

fig. 1 i perspektiv viser en udførelsesform for et ovenlysvindue ifølge opfindelsen,

fig. 2 et eksploderet billede svarende til fig. 1, hvor beklædningselementer er vist fjernet fra træprofilerne i vinduets karm- og rammekonstruktioner,

fig. 3 et skematisk sidebillede, delvis i snit, til illustration af et eksempel på udførelse af tilslutningen mellem et øvre og et nedre kapselement,

fig. 4 et sidebillede, delvis i snit, af vinduet i fig. 1 og 2 i åben stilling,

fig. 5 et sidebillede af en særlig udførelsesform for ovenlysvinduet som kombineret top/sving-vindue, og

fig. 6 et delvis snit i et karmsidestykke til illustration af fastgørelsen af karmbeklædningselementer.

Ved den i fig. 1 og 2 viste udførelsesform er ovenlysvinduet ifølge opfindelsen et oplukkeligt vindue med en karmkonstruktion omfattende et topstykke 1, et bundstykke 2 og sidestykker 3 og 4 samt en oplukkelig rammekonstruktion med et topstykke 5, et bundstykke 6 og sidestykker 7 og 8.

Rammekonstruktionen er ved hjælp af i og for sig kendte svingbeslag 9 mellem karm- og rammesidestykkerne 3, 4 og 7, 8 lejret svingbart i karmkonstruktionen med en omdrejningsakse 10 parallel med top- og bundstykkerne og i det væsentlige midt imellem disse.

Karm- og rammekonstruktionernes top-, bund- og sidestykker er overvejende opbygget af træprofiler, som på alle overflader, der er udsat for vejrligets påvirkning er beklædt med beklædningselementer, som i den

viste udførelsesform udgøres af forholdsvis tynde metalpladeprofiler, f.eks. af aluminium, og tilsammen tilvejebringer en fuldstændigt vejrskærmende indkapsling af vinduet.

Således er karmsidestykkerne 3 og 4 beklædt med langstrakte beklædningsselementer 11 med et hovedsageligt Z-formet tværsnit omfattende en sidevæg 11a, som dækker den øverste, uden for tagbelægningen liggende del af karmsidestykkets udadvendende sideflade vinkelret på den tagflade, hvori vinduet er indbygget, en overvæg 11b, som dækker den tilstødende overkant af karmsidestykket, og en fra overvæggen opstående, forholdsvis lav flangevæg 11c.

Karmbundstykket 2 er beklædt med et langstrakt beklædningsselement 12 med hovedsageligt L-formet tværsnit omfattende en bundvæg 12a, som dækker den på tagfladen vinkelrette underside af karmbundstykket, og en overvæg 12b, som dækker den tilstødende overside af karmbundstykket.

For at tilvejebringe en tæt samling ved overgangene mellem de to karmsidebeklædningsselementer 11 og karmbundbeklædningsselementet 12 er sidebeklædningsselementerne 11 ved deres nederste ender udformet med indgrebsflanger 13 i form af ombukkede yderdele af sidevæggene 11a til indgreb med udragende flangedele 14 fra enderne af bundbeklædningsselementet 12.

Karmbeklædningsselementerne 11 og 12 er forbundet med de respektive karmprofiler 3, 4 og 2 ved hjælp af skruer, som fortrinsvis er indskruet i karmprofilernes overkanter, således som det er nærmere forklaret i det følgende under henvisning til fig. 5.

I rammekonstruktionen er top- og sidestykkerne beklædt med et indvendigt, dvs. mod vinduets glasareal liggende glaslisteprofil 15 med en indragende glaslisteflange 15a, der via en mellemliggende tætnings-

strimmel ligger an mod kanten af vinduets glaselement 16, der typisk udgøres af en 2- eller 3-lags termorude. I tilslutning til glaslisteflängen 15a omfatter glaslisteprofilet 15 langs kanterne af termoruden 16 en hovedsageligt U-formet profildel med en opstående flangevæg 15b, som på rammesidestykkerne 7 og 8 følger den lave flangevæg 11c af beklædningsselementerne 11 på karmsidestykkerne 3 og 4.

Tilsvarende er rammebundstykket 6 beklædt med et hovedsageligt L-formet beklædningsselement 17 med et glaslisteprofil 18, som her dækker hele oversiden af rammebundstykket 6, og en undervæg 19, der dækker rammebundstykket 6's underside og overlapper beklædningsselementet 12 på karmbundstykket 2.

De på karm- og rammesidestykkernes oversider liggende dele af beklædningsselementerne 11 og glaslisteprofilerne 15 overlappes på hver sin side af omdrejningsaksen 10 af henholdsvis et øvre kapselement 20 og et nedre kapselement 21. Disse kapselementer er i den viste udførelsesform udført som flade trugformede profiler med samme hovedsageligt U-formede profiltværsnit omfattende en ydervæg 20a, 21a og to lave sidevægge 20b, 21b og 20c, 21c, som dækker de lave opstående flangevægge 11c og 15b på henholdsvis beklædningsselementet 11 og glaslisteprofilet 15.

Som det fremgår af fig. 2 og 3 er det nedre kapselement 21 ved sin øverste ende udformet med en forkrøppet tilslutningsdel 22, som er skudt ind under den nederste ende på det øvre kapselement 20. Tilslutningsdelen 22 har en sådan form, f.eks. som vist svagt kileformet, at kapselementerne 20 og 21 i vinduets lukkede stilling ligger i forlængelse af hinanden med deres ydervægge 20a og 21a og sidevægge henholdsvis 20b, 21b og 20c, 21c i flugt med hinanden. Denne udformning af kapselementerne 20 og 21 bevirker

i vinduets lukkede stilling et designmæssigt attraktivt ydre udseende af vinduet, hvor kapselelementerne 20 og 21 ved hver side af vinduet fremtræder som ét sammenhængende element.

Samtidigt sikrer forkrøpningen af tilslutningsdelen 22, at det til rammesidestykket 7, 8 fastgjorte, nedre kapselelement 21 ved åbning af vinduet som vist i fig. 3 kan følge rammekonstruktionens nederste del under dennes udsvingning og således uhindret svinge udad i forhold til det øvre kapselelement 20, som i den viste udførelsesform er fastgjort til karmsidestykket 3, 4.

Som det mere tydeligt ses i fig. 3 danner den forkrøppede tilslutningsdel 22 ved overgangen til kapselelementet 21 en grøft 22a, som tilvejebringer et trykaflastningskammer, der forhindrer vandindtrængning nedefra under det øvre kapselelement 20.

I den viste udførelsesform er det nedre kapselelement 21 fremstillet ved en presseoperation, således at sidevognene 21b-c forinden er formet i ét stykke med en bundvæg 21d med glatte hjørner. Denne lukning bidrager til det attraktive udseende af vinduet og medfører en god beskyttelse af rammesidestykkerne 7 og 8's nederste dele mod vejrpåvirkninger.

De øvre og nedre kapselelementer 20 og 21 er ifølge opfindelsen forbundet med de respektive karm- og rammesidestykker henholdsvis 3, 4 og 7, 8, således at de er nemme at montere med stor nøjagtighed og tillige nemt kan afmonteres, samtidigt med at fugtpåvirkning af og vandindtrængning til karm- og rammesidestykkernes trædele i alt væsentligt undgås.

Det øvre kapselelement 20 fastholdes således med en tilslutningsdel 23 ved sin øverste ende alene af et øvre beklædningselement 32 for karm- og rammetopstykkerne 1 og 5 mod et understøtningselement 24, som i den

viste udførelsesform er fastgjort til karmsidestykket 3, 4's overside.

Det nedre kapselelement 21 er ved sin nederste ende udformet med et indgrebsorgan, som i den viste udførelsesform har form som en fra bundvæggen 21d udragende og med ydervæggen 20a parallel indgrebskonsol 25 med en nøglehulformet indskæring 26 til indgreb med og fastholdelse af tapelement 27, som er fastgjort til beklædningsselementet 17 på rammebundstykket 6.

I deres modsatte ende er det øvre kapselelement 20 og det nedre kapselelement 21 udformet med befæstigelseselementer i form af skruehuller 28 for skruer 29 til indskrining i skruebeslag 30 og 31, som i den viste udførelsesform er forbundet med karm- og rammesidestykkerne 3, 4 og 7, 8 uden for disses træprofildele.

Skruebeslagene 30 og 31 kan hensigtsmæssigt være udført af plastmateriale og fastgjort til de dele af svingebeslaget 9, som er forbundet henholdsvis med karmsidestykket 3, 4 og med rammesidestykket 7, 8. Herigennem undgås det at føre befæstigelsesskruer ind i karm- og rammesidestykkernes trædele.

Ved karm- og rammekonstruktionernes topstykker 1 og 5 er vinduets indkapsling afsluttet med den hovedsageligt hætteformede topkapsel 32, som ved udførelsesformen i fig. 1 - 3 er udført i ét stykke og forbundet med karmtopstykket 1. Topkapslen 32 er udformet, så den dækker de øverste dele af beklædningselementerne på karm- og rammesidestykkerne 3, 4 henholdsvis 7, 8, herunder de øverste dele af de øvre kapselelementer 20.

I fig. 5 er i et skematisk sidebillede vist en alternativ udførelse af ovenlysvinduet som et kombineret dreje/vippe-vindue, hvor rammekonstruktionen 33 under normalt brug er tophængt i forhold til karmkonstruktionen 34, således at vinduet som vist fuldt optrukket fungerer som et tophængt drejevindue, der

åbnes ved hjælp af et separat betjeningsgreb 35 på indersiden af rammebundstykket.

For at vinduesrammen kan svinges omtrent 180° til en bekvem pudsestilling er rammekonstruktionen 33 tillige forbundet svingbart med en mellemramme med rammearme 36, som i vinduets lukkede stilling er placeret mellem de øverste dele af karm- og rammesidestykkerne 2, 4 henholdsvis 7, 8 og under vinduets normale brug som tophængt drejevindue følger rammesidestykkerne. Omdrejningsaksen for denne svingbare forbindelse ligger omtrent midt mellem top- og bundstykkerne på samme måde som vist i fig. 4, og betjening af vinduet til denne vippe- eller svingbevægelse foretages på en ved ovenlysvinduer hyppigt anvendt måde ved hjælp af en med rammetopstykket svingbart forbundet ventilations- og betjeningsklap 37, som udløser en ikke-vist, mellem karm- og rammetopstykkerne liggende lukkemekanisme.

Idet dette dobbelte bevægelsesmønster indebærer, at rammens øverste del både, ved den normale brug som tophængt vindue, skal kunne dreje udefter i forhold til karmen og, ved nævnte svingbevægelse til pudsestillingen, skal kunne svinge indad i forhold til karmen på samme måde som vist i fig. 4, er det øvre kapselelement 20', der i øvrigt kan være udformet på samme måde som kapselelementet 20 i fig. 1 og 2, i hver side fastgjort til mellemrammearmen 36, idet dels øverste ende af en med mellemrammen forbundet underdel 38 af topkapslen fastholdes mod et med mellemrammearmen forbundet understøtningsselement, medens dets nederste del med en skrueforbindelse fastholdes til skruebeslaget 30', som er forbundet med den med mellemrammearmen 36 forbundne del af det ikke-viste svingbeslag mellem mellemrammearmen og rammesidestykket 7, 8.

Ved udførelsesformen i fig. 5 er topkapslen

tillige under hensyn til ovennævnte bevægelsesmuligheder udført todelt, idet den omfatter den med mellemrammens forbundne underdel 38 og en med karmtopstykket forbundet overdel 39.

Med den angivne udformning og montering af de øvre og nedre kapselelementer 20 og 21 opnås en særdeles god beskyttelse af trædelene i rammeprofilerne og de ikke af andre beklædningselementer dækkede trædele i karmprofilerne, bl.a. som følge af at befæstigelsesskruer for kapslerne ikke er ført ind i trædelene.

Som vist i fig. 6 kan der for skrueforbindelserne mellem karmsidebeklædningselementerne 11 og karmsidestykkerne 3, 4 opnås en god beskyttelse mod vandindtrængning til trædelene i karmsidestykkerne ved anvendelse af en underlagsbøsning 40 af plastmateriale til anbringelse i en forboret fordybning 41 i træprofilen. Underlagsbøsningen 40 har en aftrappet cylindrisk form med en hoveddel 42 til optagelse af det ved undersænkning nedbøjede randparti 43 af beklædningselementet 11 omkring skruehullet 44 og en indsnævret skaftdel 45 med udragende modhager 46 til fastholdelse af bøsningen i den forborede fordybning 41. I bunden af skaftdelen 45 er udformet et hul 47 med mindre diameter end befæstigelsesskruen, således at der ved dennes iskruning tilvejebringes en god tætning.

Til yderligere sikring af skrueforbindelse kan der i bunden af bøsningen 40's hoveddel 42 være udformet en opstående krave 48 eller eventuelt flere opstående flige, der virker som spændskive mod det undersænkede randparti 43, og sikrer, at skruehovedet ikke kan overskrues og deformere beklædningselementet 11.

P A T E N T K R A V

1. Ovenlysvindue med en glasbærende rammekonstruktion sammensat af vandrette top- og bundstykker (1, 2; 5, 6) som er forbundet gennem parallelle sidestykker (2, 4; 7, 8), som i det mindste delvis er udformet af træprofiler, som på de udadvendende sider er dækket af vejrskærmende beklædningsselementer (11, 12, 15, 17, 20, 21, 32) til tættnende indeslutning af de underliggende træprofiler på alle uden for tagbelægningen liggende overflader, hvilke beklædningsselementer er forbundet med træprofilerne ved hjælp af indgrebs- og befæstigelseselementer (23-29, 40), som er således udformet og/eller placeret i forhold til beklædningsselementerne, at indtrængning af vand og fugt til eller i træprofilerne i det væsentlige forhindres, hvorved beklædningsselementerne omfatter en hættelignende øvre beklædningskapsel (32) til dækning af topstykket (1, 5), et indvendigt glaslisteprofil (15) til dækning af en mod vinduets lysåbning vendende del af hvert sidestykkes overkant (7, 8), et udvendigt beklædningsselement (11) til dækning af den uden for tagfladen liggende del af hvert sidestykkes (3, 4) yderside og den hertil stødende del af sidestykkets overkant, og et kapselement (20, 21), som overlapper glaslisteprofilet (15) og nævnte beklædningsselement (11) og for neden fastgjort til sidestykkets (7, 8) nederste del, medens det foroven er fastholdt mod sidestykkets (3, 4) øverste del, k e n d e t e g n e t ved, at kapselementet (20) ved sin øverste ende er fastholdt af nævnte øvre beklædningskapsel (32) og ved sin nederste ende er udformet integreret med et ombukket skjult indgrebsorgan (25, 26) til indgreb med et indgrebselement (24) fastgjort ved den nederste ende af sidestykket (7, 8).

2. Ovenlysvindue ifølge krav 1, k e n d e t e g n e t ved, at rammekonstruktionen er lejret som

svingramme i en karmkonstruktion med top- bund- og sidestykker (1 - 4) i det mindste delvis udformet af træprofiler, hvorved den hættelignende øvre beklædningskapsel (32) dækker karm- og rammekonstruktionernes topstykker (1, 5), medens det udvendige beklædningsselement (11) dækker hvert karmsidestykkes (3, 4) yderside og den hertil stødende del af dets overkant.

3. Ovenlysvindue ifølge krav 2, k e n d e t e g n e t ved, at rammekonstruktionen har svingeakse (10) parallelt med og omtrent midt imellem top- og bundstykkerne (1,2; 5, 6) , og at nævnte kapselelement omfatter et øvre og et nedre kapselelement (20, 21) anbragt på hver sin side af svingeaksen, idet det øvre kapselelement (20) er fastgjort til karmsidestykkets (3, 4) øverste del eller til en mellem karm- og rammesidestykkerne (3, 4; 7, 8) forbundet mellemrammearm (36), medens det nedre kapselelement (21) er fastgjort til rammesidestykkets nederste del, hvilke kapselelementer (20, 21) i kort afstand fra det øvre kapselelements nederste ende og det nedre kapselelements øverste ende har befæstigelseselementer til fastgørelse til beslag i fast forbindelse henholdsvis med karmsidestykkerne (3, 4) eller nævnte mellemrammearme og med rammesidestykkerne (7, 8) uden for disses træprofiler.

4. Ovenlysvindue ifølge krav 1, 2 eller 3, k e n d e t e g n e t ved, at indgrebsorganet ved kapselelementets nederste ende omfatter et med kapselelementets ydervæg (21a) parallel indgrebskonsol (25) med en nøglehulformet udskæring (26) til indgreb med og fastholdelse af et tapelement (27) fastgjort til rammesidestykket (7, 8).

5. Ovenlysvindue ifølge krav 3, k e n d e t e g n e t ved, at nævnte befæstigelseselementer omfatter skruehuller (28) i kapselelementernes (20, 21) ydervægge (20a, 21a), og at nævnte beslag udgøres af skrue-

beslag (30, 31) for skruer (29).

6. Ovenlysvindue ifølge krav 5, k e n d e t e g n e t ved, at nævnte skruebeslag (30, 31) er forbundet med et svingbeslag i forbindelse henholdsvis med karmsidestykket (3, 4) eller nævnte mellemrammearm (36) og med rammesidestykket (7, 8).

7. Ovenlysvindue ifølge et af de foregående krav, k e n d e t e g n e t ved, at kapselelementet (20, 21) er udført som et fladt trugformet profil med U-formet profiltværsnit omfattende en ydervæg (20a, 21a) og to lave sidevægge (20b-c, 21b-c), som dækker opretstående flangevægge (15b, 11c) på henholdsvis glaslisteprofilet (15) og det udvendige beklædningsselement (11).

8. Ovenlysvindue ifølge krav 3 og 7, k e n d e t e g n e t ved, at det øvre og nedre kapsel element har samme profiltværsnit, og at det nedre kapselelement (21) ved sin øverste ende har en under den nederste ende af det øverste kapselelement (20) indskudt, forkrøppet tilslutningsdel (22) med en sådan form, at kapselelementerne (20, 21) i vinduets lukkede stilling er placeret med deres ydervægge (20a, 21a) og sidevægge (20b-c, 21b-c) i flugt med hinanden, og at det nedre kapselelement (21) ved åbning af vinduet kan svinge uhindret udad i forhold til det øvre kapselelement (20).

9. Ovenlysvindue ifølge krav 8, k e n d e t e g n e t ved, at nævnte forkrøppede tilslutningsdel (22) på det nedre kapselelement (21) mod den nederste ende af det øvre kapselelement (20) danner et trykaflastningskammer (22a) til forhindring af vandindtrængning nedefra under det øvre kapselelement (20).

10. Ovenlysvindue ifølge krav 7, 8 eller 9, k e n d e t e g n e t ved, at det kapselelementet (21) forneden er udformet med en med dets sidevægge (21b-c) i ét stykke forbundet bundvæg (21d).

11. Ovenlysvindue ifølge krav 4 og krav 9, k e n - d e t e g n e t ved, at nævnte indgrebskonsol (25) er udformet som en med det nedre kapselelements (21) ydervæg (21a) parallel, bukket flangedel i forbindelse med nævnte bundvæg (21d).

12. Ovenlysvindue ifølge at de foregående krav, k e n d e t e g n e t ved, at de udvendige beklædningsselementer (11) ved deres nederste ender er udformet med indgrebsflanger (13) til tætnende forbindende indgreb med udragende flangedele (14) fra enderne af et udvendigt beklædningsselement (12) for karmbundstykket (2).

13. Ovenlysvindue ifølge krav 3, hvor rammekonstruktionen (33) under normalt brug er lejret som tophængt drejevindue med omdrejningsakse ved karm- og rammetopstykkerne (1', 5'), medens nævnte svingeakse omtrent midt mellem top- og bundstykkerne (1', 2'; 5', 6') er tilvejebragt ved svingbar forbindelse af rammesidestykkerne (7', 8') med mellemrammearme (36) med henblik på at muliggøre vending af vinduet til en pudsestilling, k e n d e t e g n e t ved, at det øvre kapselelement (20') er fastgjort til nævnte mellemrammearme (36), og at et øvre beklædningsselement for topstykkerne (1', 5') er udført todelt med en med mellemrammen forbundet underdel (38) og en med karmtopstykket (1') forbundet overdel (39).

14. Ovenlysvindue ifølge et af de foregående krav, k e n d e t e g n e t ved, at udvendige beklædningsselementer (11) er fastgjort til ramme- eller karmkonstruktionen (3, 4) ved skrueforbindelser (29) indskruet i underlagsbøsninger (40) af plastmateriale, som er befestiget i ramme- eller karmkonstruktionens (3, 4) træprofiler.

Ovenlysvindue med karm- og rammebeklædningselementer.

S A M M E N D R A G

I et ovenlysvindue med en karmkonstruktion og en oplukkelig glasbærende rammekonstruktion er top-, bund- og sidestykker (1 - 8) for karm- og rammekonstruktionerne i hovedsagen udformet af træprofiler, som på de udadvendende sider er dækket af beklædningselementer af vejrskærmende materiale, som er forbundet med træprofilerne ved hjælp af indgrebs- og befæstigelseselementer.

Beklædningselementerne (11, 12, 15, 17, 20, 21, 32) er udformet til tættnende indeslutning af de underliggende træprofiler i karm- og rammekonstruktionerne på alle uden for tagbelægningen liggende overflader, og indgrebs- og befæstigelseselementer (23-29, 40) er således udformet og/eller placeret i forhold til beklædnings-elementerne, at indtrængning af vand og fugt til eller i træprofilerne i det væsentlige forhindres.

(Fig. 2)

1/4

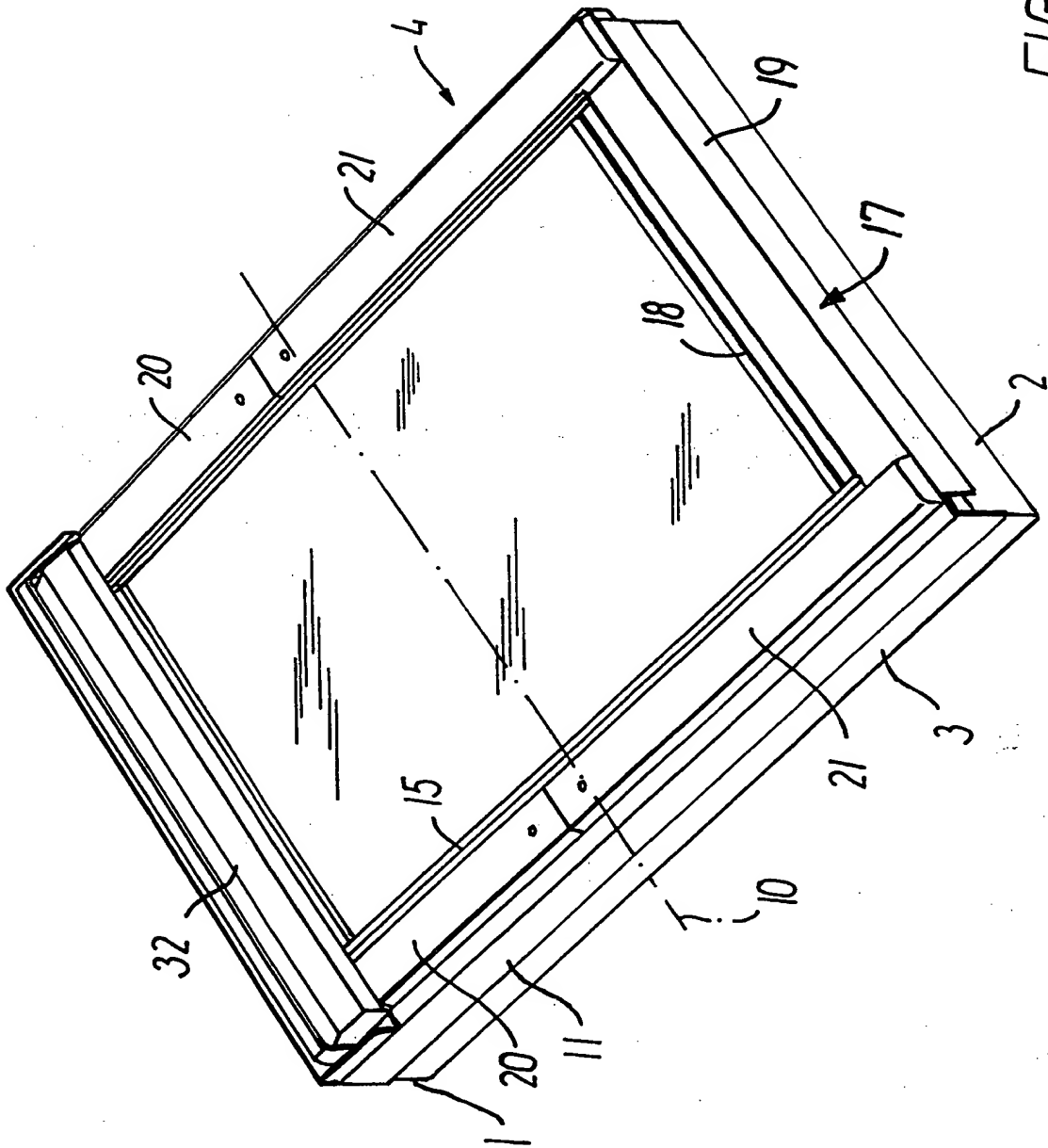
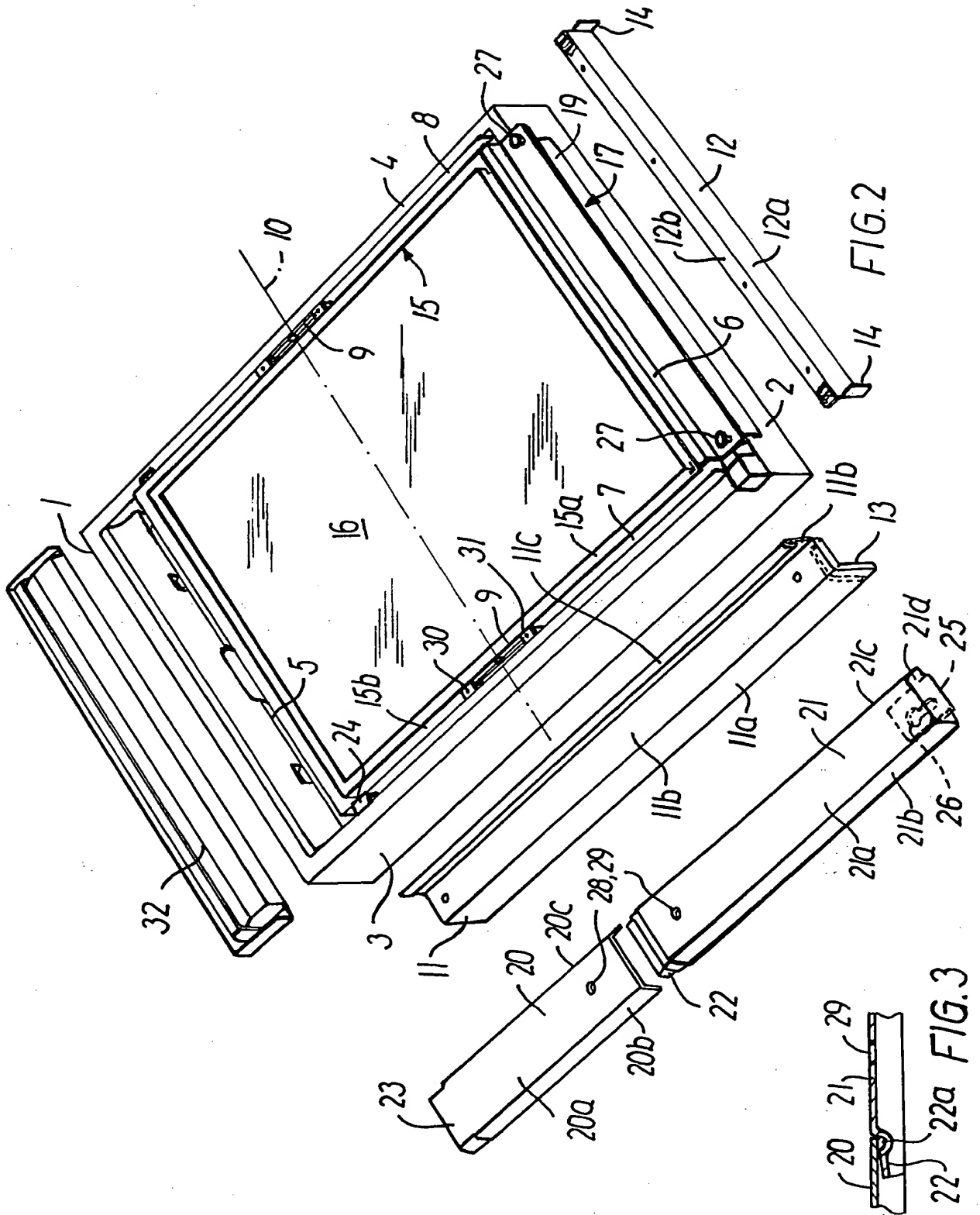


FIG. 1

2/4



3/4

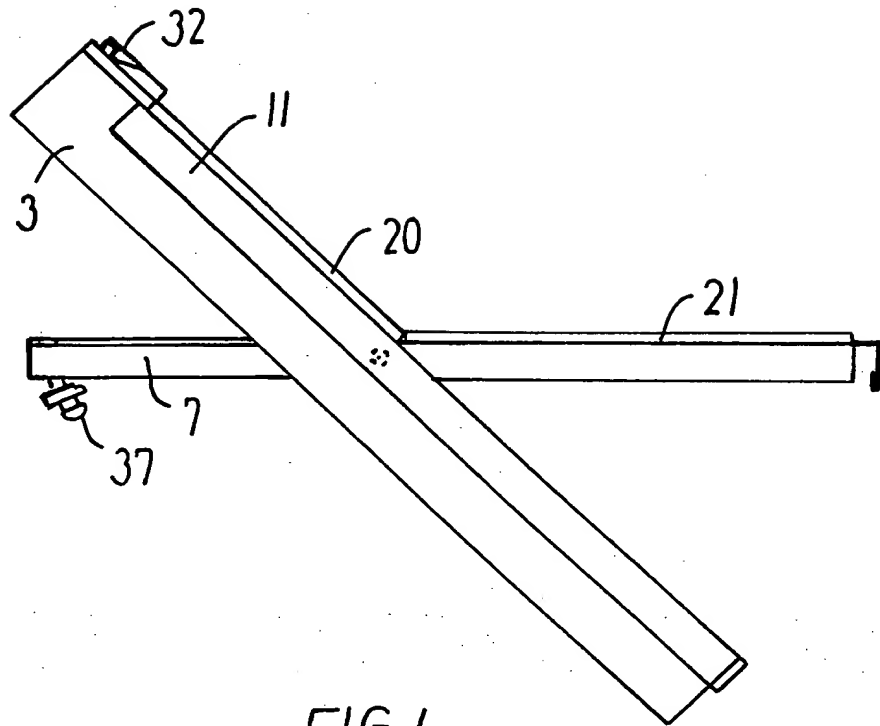


FIG. 4

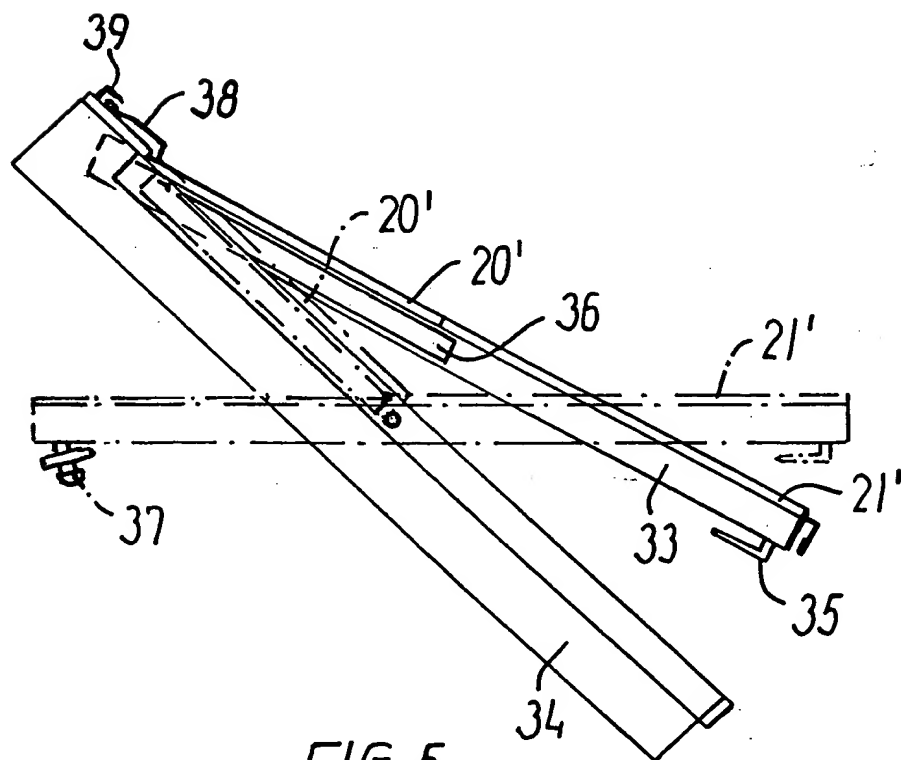


FIG. 5

4/4

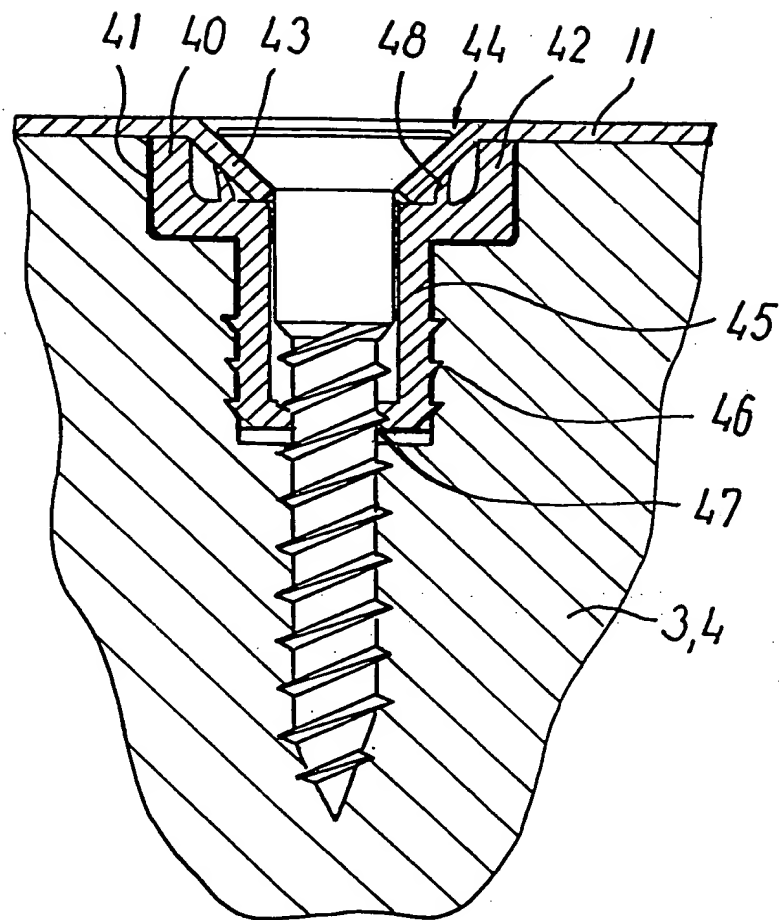


FIG. 6

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing: 14 October 1999 (14.10.99)	
International application No.: PCT/DK99/00169	Applicant's or agent's file reference: IPB/26163
International filing date: 25 March 1999 (25.03.99)	Priority date: 07 April 1998 (07.04.98)
Applicant: HANSEN, Birgitte et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International preliminary Examining Authority on:
30 July 1999 (30.07.99)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer: J. Zahra Telephone No.: (41-22) 338.83.38
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COPY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

To:

CARLSSON, E.
International Patent-Bureau
Hoje Taastrup Boulevard 23
DK-2630 Taastrup
Taastrup
DANEMARK

Date of mailing
(day/month/year)

25. 04. 00

Applicant's or agent's file reference
IPB/26163

IMPORTANT NOTIFICATION

International application No.
PCT/DK99/00169

International filing date (day/month/year)
25/03/1999

Priority date (day/month/year)
07/04/1998

Applicant
VELUX Industri A/S et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Himmel, U

Tel. +49 89 2399-2876



PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IPB/26163	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK99/00169	International filing date (day/month/year) 25/03/1999	Priority date (day/month/year) 07/04/1998
International Patent Classification (IPC) or national classification and IPC E04D13/02		
Applicant VELUX Industri A/S et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 30/07/1999	Date of completion of this report 25.04.00
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Kofoed, P Telephone No. +49 89 2399 2927 <div style="text-align: right;">  </div>

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK99/00169

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

5-11 as originally filed

1-4 as received on 28/01/2000 with letter of 25/01/2000

Claims, No.:

1-14 as received on 28/01/2000 with letter of 25/01/2000

Drawings, sheets:

1/4-4/4 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK99/00169

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following document, also cited by the applicant:

D1: DE-A-24 43 098

1.1 The invention relates to a roof window with weather-shielding covering members for sealing enclosure of the subjacent wood profiles on all surfaces protruding from the roofing. The closest prior art is found in figure 1 of document D1, which discloses a roof window according to the preamble of claim 1.

2 The subject-matter of claim 1 is new and also inventive for the following reasons (Articles 33(2)&(3) PCT):

Problem: To further develop such a window, that the mounting of the covering members is facilitated without diminishing their weather-shielding capabilities.

The **solution** is according to claim 1 essentially given by

- 1) the retaining fixing of the cap member (20, 21) at the top with the upper covering cap (32), and by
- 2) the integral bent, hidden engagement means (25, 26) at the bottom for snapping engagement of the cap member (21) with an engagement means (24) secured at the lower end of the side member (7, 8).

3 None of the documents cited in the research report indicate this solution, nor give hints which in combination could lead thereto. Document D1, see figures 1 & 2, solves the problem by securing the covering member to the frame and sash profiles by engagement with shackles fastened to the profiles with nails. However, this solution has the drawback that the covering members have to be mounted by sliding them in the longitudinal direction on the shackles.

A ROOF WINDOW WITH MAIN FRAME AND SASH COVERING MEMBERS

The present invention relates to a roof window with a pane supporting frame structure consisting of 5 horizontal top and bottom members connected by parallel side members, which are at least partially wood profiles which on the outwards facing sides are covered by weather-shielding covering members for sealing enclosure of the subjacent wood profiles on all surfaces protruding from the roofing, said covering members 10 being connected with the wood profiles by means of engagement and securing means which are designed in such manner and/or positioned such relative to the covering members that penetration of water and moisture 15 into the wood profiles is substantially prevented, the covering members comprising a hood-like upper covering cap for covering the top member, an interior glazing profile for covering a part of the upper edge of each frame side member facing the light-admitting area of 20 the window, an exterior covering member for covering the part of the exterior side of each frame side member protruding from the roofing and the adjoining part of the upper edge of the frame side member, and a cap member overlapping the glazing profile and said 25 covering member, the cap member being at the bottom secured to the lower part of the side member, whereas at the top it is secured to the upper part of the side member.

Roof windows of this type, both openable and not 30 openable, are well known and are widely used for ensuring improved admittance of daylight when converting ceilings of buildings into rooms for accommodation and business purposes.

The purpose of using weather-shielding covering 35 members, which may consist of comparatively thin metal

sheet profiles, for instance of aluminium, or plastic profiles, is to provide, to the highest degree possible, a total exterior protection of the wood profiles in the top, bottom and side members of the main frame 5 and sash structures.

In conventional embodiments of roof windows the covering members are typically secured to the wood profile members of the main frame and sash structures by means of screw connections which are screwed directly 10 ly into the subjacent wooden parts, which in order to obtain a sufficiently exact mounting requires pre-bored screw holes in the wooden parts and has turned out to entail a risk of moisture or water penetration into the wooden parts, in particular through the screw holes in 15 the covering members.

In openable roof windows, the covering members on the outwards facing sides of the side members of the main frame and sash structures typically comprise an upper and a lower cap member in connection with the 20 upper part of the main frame side member above the pivot axis and with the lower part of the sash side member under the pivot axis such that the lower cap member may follow the swinging of the sash structure by opening of the window. In conventional windows it has 25 in respect of these cap members turned out to be difficult to obtain a satisfactory sealing at the transition between the upper and lower cap members, and at the lower end of the lower cap members.

Attempts have been made to solve this problem by 30 use of a roof window known from DE-A-24 43 098, in which covering members are secured to the main frame and sash profiles by engagement with shackles fastened to the profiles by screws or nails. However, this design makes it necessary to mount the covering members 35 by sliding them on the main frame and sash profiles in

the longitudinal direction thereof.

The object of the invention is to provide a system of covering members for a roof window with a fully closed enclosure of the wooden parts of the frame and sash profiles, the mounting being at the same time facilitated.

To meet this object, the roof window according to the invention is characterized in that the cap member is retained at its upper end at said top by said upper covering cap and is provided at said bottom with an integral bent, hidden engagement means for snapping engagement with an engagement means secured at the lower end of the side member.

In this way a particular good protection of the wood profiles against moisture or water penetration is obtained and the mounting is at the same time facilitated, the cap member being first slid under the upper covering cap and then connected with its lower end to the lower end of the side member by snapping engagement.

The invention may advantageously be used both in connection with not openable roof windows with a frame structure fixedly positioned in the roof structure and in connection with conventional, openable roof windows.

A preferred embodiment of such an openable roof window is according to the invention obtained thereby that the sash structure has a pivot axis parallel with and approximately halfway between the top and bottom members, and that said cap member comprises an upper and a lower cap member placed on either side of the pivot axis, the upper cap member being secured to the upper part of the main frame side member or to an intermediate sash arm connected between the frame and sash side members, whereas the lower cap member is secured to the lower part of the sash side member, said

cap members being at a short distance from the lower end of the upper cap member and the upper end of the lower cap member provided with securing means for being secured to fittings in fixed connection with the main
5 frame side members or said intermediate sash arms, respectively, and with the sash side members, but positioned outside of the wood profiles thereof.

Further advantageous embodiments of the roof window according to the invention and the accompanying
10 covering members are stated in the subclaims.

The invention will now be explained in detail in the following with reference to the schematic drawing, in which

Fig. 1 is a perspective view of an embodiment of
15 a roof window according to the invention,

Fig. 2 is an exploded view corresponding to Fig. 1, in which the covering members have been removed from the wood profiles in the frame and sash structures of window,

20 Fig. 3 is a schematic lateral view, partly in section, for illustration of an example of the connection between an upper and a lower cap member,

Fig. 4 is a lateral view, partly in section, of the window shown in Figs 1 and 2 in an open position,

25 Fig. 5 is a lateral view of a particular embodiment of the roof window as a combined top/pivot window, and

Fig. 6 is a partial section of a frame side member for illustrating the fastening of frame covering mem-
30 bers.

In the embodiment shown in Figs 1 and 2, the roof window according to the invention is an openable window with a main frame structure comprising a top member 1, a bottom member 2, and side members 3 and 4, and an
35 openable sash structure with a top member 5, a bottom

P A T E N T C L A I M S

1. A roof window with a pane supporting frame structure consisting of horizontal top and bottom members (1, 2; 5, 6) connected by parallel side members (2, 4; 7, 8), which are at least partially wood profiles which on the outwards facing sides are covered by weather-shielding covering members (11, 12, 15, 17, 20, 21, 32) for sealing enclosure of the subjacent wood profiles on all surfaces protruding from the roofing, said covering members being connected with the wood profiles by means of engagement and securing means (23-29, 40) which are designed in such manner and/or positioned such relative to the covering members that penetration of water and moisture into the wood profiles is substantially prevented, the covering members comprising a hood-like upper covering cap (32) for covering the top member (1, 5), an interior glazing profile (15) for covering a part facing the light-admitting area of the window of the upper edge (7, 8) of each frame side member, an exterior covering member (11) for covering the part protruding from the roofing of the exterior side of each frame side member (3, 4) and the adjoining part of the upper edge of the frame side member, and a cap member (20, 21) overlapping the glazing profile (15) and said covering member (11), the cap member being at the bottom secured to the lower part of the side member (7, 8), whereas at the top it is secured to the upper part of the side member (3, 4), characterized in that the cap member (20, 21) at is retained at said top by said upper covering cap (32) and is provided at said bottom with an integral bent, hidden engagement means (25, 26) for snapping engagement with an engagement means (24) secured at the lower end of the side member (7, 8).

2. A roof window according to claim 1, characterized in that the cap member (20, 21) is provided with a locking means (27, 28) for locking the cap member (20, 21) to the side member (7, 8).

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a c t e r i z e d in that the frame structure comprises a pivot sash accommodated in a main frame structure with top, bottom and side members (1 - 4) at least partially made of wood profiles, the hood-like
5 upper covering cap (32) covering the top members (1, 5) of the main frame and sash structures, whereas the exterior covering member (11) covers the exterior side of each main frame side member (3, 4) and the adjoining part of its upper edge.

10 3. A roof window according to claim 2, c h a r - a c t e r i z e d in that the sash structure has a pivot axis (10) parallel with and approximately halfway between the top and bottom members (1, 2; 5, 6), and that said cap member comprises an upper and a lower cap
15 member (20, 21) placed on either side of the pivot axis, the upper cap member (20) being secured to the upper part of the main frame side member (3, 4) or to an intermediate sash arm (36) connected between the main frame and sash side members (3, 4; 7, 8), whereas
20 the lower cap member (21) is secured to the lower part of the sash side member, said cap members (20, 21) being at a short distance from the lower end of the upper cap member and the upper end of the lower cap member provided with securing means for being secured
25 to fittings in fixed connection with the main frame side members (3, 4) or said intermediate sash arms, respectively, and with the sash side members (7, 8) outside the wood profiles thereof.

4. A roof window according to claim 1, 2 or 3,
30 c h a r a c t e r i z e d in that the engagement means at the bottom of the cap member (21) comprises an engagement bracket (25) parallel with the exterior wall (21a) of the cap member, said bracket being provided with a keyhole-shaped recess (26) for engagement with
35 and securing of a pin member (27) fastened to the frame

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side member (7, 8).

5. A roof window according to claim 3, c h a r -
a c t e r i z e d in that said securing means comprise
screw holes (28) in the exterior walls (20a, 21a) of
5 the cap members (20, 21) and in that said fittings are
screw fittings (30, 31) for screws (29).

6. A roof window according to claim 5, c h a r -
a c t e r i z e d in that said screw fittings (30, 31)
are connected with a swing fitting in connection with
10 the main frame side member (3,4) or said intermediate
sash arm (36) and the sash side member (7,8), respect-
ively.

7. A roof window according to one of the preceding
claims, c h a r a c t e r i z e d in that the cap
15 member (20, 21) is designed as a flat, trough-shaped
profile with U-shaped profile cross section comprising
an exterior wall (20a, 21a) and two low side walls
(20b-c, 21b-c) covering upright flange walls (15b, 11c)
on the glazing profile (15) and the exterior covering
20 member (11).

8. A roof window according to claims 3 and 7,
c h a r a c t e r i z e d in that the upper and the
lower cap members have the same profile cross section
and that the lower cap member (21) at its upper end has
25 a joggled connection member (22) inserted under the
lower end of the upper cap member (20), said connection
member having such a shape that the cap members (20,
21) in the closed position of the window are placed
with their exterior walls (20a, 21a) and side walls
30 (20b-c, 21b-c) in alignment with each other, and in
that the lower cap member (21), when the window is
opened, may swing unimpededly outwards relative to the
upper cap.

9. A roof window according to claim 8, c h a r -
35 a c t e r i z e d in that said joggled connection

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member (22) on the lower cap member (21) against the lower end of the upper cap member (20) forms a pressure relieve chamber (22a) to prevent water penetration from below under the upper cap member (20).

5 10. A roof window according to claim 7, 8 or 9, characterized in that the cap member (21) at the bottom is provided with a bottom wall (21d) integrally connected with its side walls (21b-c).

10 11. A roof window according to claims 4 and 9, characterized in that said engagement bracket (25) is designed as a bent flange member in parallel with the exterior wall (21a) of the lower cap member (21), said flange member being connected with said bottom wall (21d).

15 12. A roof window according to any of the preceding claims, characterized in that the exterior frame covering members (11) at their lowest ends are provided with engagement flanges (13) for sealing, positive locking engagement with protruding
20 flange members (14) from the ends of an exterior frame covering member (12) for the frame bottom member (2).

13. A roof window according to claim 3, in which the sash structure (33) under normal use is accommodated as a top-hung pivot window with an axis of
25 rotation at the main frame and sash top members (1', 5'), whereas said pivot axis approximately halfway between the top and bottom members (1', 2'; 5', 6') is provided by pivotal connection of the sash side members (7', 8') to intermediate sash arms (36) with a view to
30 making a turning of the window into a cleaning position possible, characterized in that the upper cap member (20') is secured to said intermediate sash arms (36), and that an upper covering member for the top members (1', 5') is made in two pieces with a lower
35 part (38) connected with the intermediate sash and an

upper part (39) connected with the frame top member (1').

14. A roof window according to any of the preceding claims, characterized in that frame covering members (11) are secured to the frame structure (3, 4) by screw connections (29) screwed into bearing bushings (40) of plastic material, said bushings being secured to the wood profiles of the frame structure (3, 4).



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(71) Applicant (for all designated States except US): VELUX INDUSTRI A/S [DK/DK]; Tobaksvejen 10, DK-2860 Søborg (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HANSEN, Birgitte [DK/DK]; Østerbrogade 177, DK-2100 Copenhagen Ø (DK). NIELSEN, Peter, Foslund [DK/DK]; Brede Kærs Vænge 73, DK-2635 Ishøj (DK). NISSEN, Kaj [DK/DK]; Frederiksdalsvej 177, DK-2830 Virum (DK).

(74) Agents: RAFFNSØE, Knud, Rosenstand et al.; International Patent-Bureau, Høje Taastrup Boulevard 23, DK-2630 Taastrup (DK).

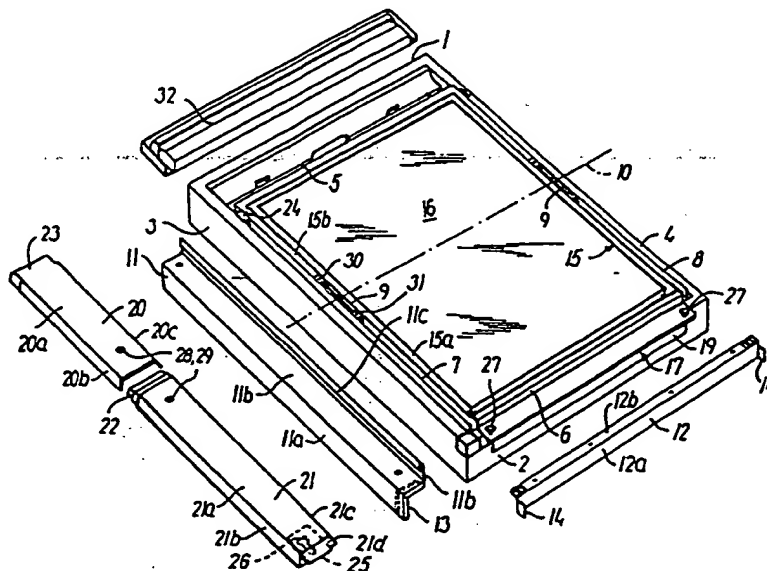
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(57) Abstract

In a roof window with a frame structure and an openable, pane supporting sash structure, the top, bottom and side members (1-8) of the frame and sash structures are for the major part made as wood profiles, which on the outwards facing sides are covered by covering members of weather-shielding material connected with the wood profiles by means of engagement and securing means. The covering members (11, 12, 15, 17, 20, 21, 32) serve as sealing enclosure for the subjacent wood profiles in the frame and sash structures on all surfaces on the outside of the roofing, and engagement and securing means (23-29, 40) are designed in such manner and/or positioned such relative to the covering members that water and moisture penetration into the wood profiles is substantially prevented.

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A ROOF WINDOW WITH MAIN FRAME AND SASH COVERING MEMBERS

The present invention relates to a roof window with a pane supporting sash structure consisting of 5 horizontal top and bottom members connected by parallel side members, which are at least partially wood profiles which on the outwards facing sides are covered by weather-shielding covering members for sealing enclosure of the subjacent wood profiles on all surfaces 10 protruding from the roofing, said covering members being connected with the wood profiles by means of engagement and securing means which are designed in such manner and/or positioned such relative to the covering members that penetration of water and moisture 15 into the wood profiles is substantially prevented, the covering members comprising a hood-like upper covering cap for covering the top member, an interior glazing profile for covering a part of the upper edge of each sash side member facing the light-admitting area of the 20 window, an exterior covering member for covering the part of the exterior side of each frame side member protruding from the roofing and the adjoining part of the upper edge of the frame side member, and a cap member overlapping the glazing profile and said 25 covering member, the cap member being at the bottom secured to the lower part of the side member, whereas at the top it is secured to the upper part of the side member.

Roof windows of this type, both openable and not 30 openable, are well known and are widely used for ensuring improved admittance of daylight when converting ceilings of buildings into rooms for accommodation and business purposes.

The purpose of using weather-shielding covering 35 members, which may consist of comparatively thin metal

sheet profiles, for instance of aluminium, or plastic profiles, is to provide, to the highest degree possible, a total exterior protection of the wood profiles in the top, bottom and side members of the frame and
5 sash structures.

In conventional embodiments of roof windows the covering members are typically secured to the wood profile members of the frame and sash structures by means of screw connections which are screwed directly
10 into the subjacent wooden parts, which in order to obtain a sufficiently exact mounting requires pre-bored screw holes in the wooden parts and has turned out to entail a risk of moisture or water penetration into the wooden parts, in particular through the screw holes in
15 the covering members.

In openable roof windows, the covering members on the outwards facing sides of the side members of the frame and sash structures typically comprise an upper and a lower cap member in connection with the upper
20 part of the frame side member above the pivot axis and with the lower part of the sash side member under the pivot axis such that the lower cap member may follow the swinging of the sash structure by opening of the window. In conventional windows it has in respect of
25 these cap members turned out to be difficult to obtain a satisfactory sealing at the transition between the upper and lower cap members, and at the lower end of the lower cap members.

Attempts have been made to solve this problem by
30 use of a roof window known from DE-A-24 43 098, in which covering members are secured to the frame and sash profiles by engagement with shackles fastened to the profiles by screws or nails. However, this design makes it necessary to mount the covering members by
35 sliding them on the frame and sash profiles in the

longitudinal direction thereof.

The object of the invention is to provide a system of covering members for an openable roof window with a fully closed enclosure of the wooden parts of the frame and sash profiles, the mounting being at the same time facilitated.

To meet this object, the roof window according to the invention is characterized in that the cap member at its upper end is retained by said upper covering cap and at its lower end is integral with a bent, hidden engagement means for snapping engagement with an engagement means secured at the lower end of the side member.

In this way a particular good protection of the wood profiles against moisture or water penetration is obtained and the mounting is at the same time facilitated, the cap member being first slid under the upper covering cap and then connected with its lower end to the lower end of the side member by snapping engagement.

The invention may advantageously be used both in connection with not openable roof windows with a sash structure fixedly positioned in the roof structure and in connection with conventional, openable roof windows.

A preferred embodiment of such an openable roof window is according to the invention obtained thereby that the sash structure has a pivot axis parallel with and approximately halfway between the top and bottom members, and that said cap member comprises an upper and a lower cap member placed on either side of the pivot axis, the upper cap member being secured to the upper part of the frame side member or to an intermediate sash arm connected between the frame and sash side members, whereas the lower cap member is secured to the lower part of the sash side member, said cap members

being at a short distance from the lower end of the upper cap member and the upper end of the lower cap member provided with securing means for being secured to fittings in fixed connection with the frame side 5 members or said intermediate sash arms, respectively, and with the sash side members, but positioned outside of the wood profiles thereof.

Further advantageous embodiments of the roof window according to the invention and the accompanying 10 covering members are stated in the subclaims.

The invention will now be explained in detail in the following with reference to the schematic drawing, in which

Fig. 1 is a perspective view of an embodiment of 15 a roof window according to the invention,

Fig. 2 is an exploded view corresponding to Fig. 1, in which the covering members have been removed from the wood profiles in the frame and sash structures of window,

20 Fig. 3 is a schematic lateral view, partly in section, for illustration of an example of the connection between an upper and a lower cap member,

Fig. 4 is a lateral view, partly in section, of the window shown in Figs 1 and 2 in an open position,

25 Fig. 5 is a lateral view of a particular embodiment of the roof window as a combined top/pivot window, and

Fig. 6 is a partial section of a frame side member for illustrating the fastening of frame covering mem- 30 bers.

In the embodiment shown in Figs 1 and 2, the roof window according to the invention is an openable window with a frame structure comprising a top member 1, a bottom member 2, and side members 3 and 4, and an 35 openable sash structure with a top member 5, a bottom

P A T E N T C L A I M S

1. A roof window with a pane supporting sash structure consisting of horizontal top and bottom members (1, 2; 5, 6) connected by parallel side members (2, 4; 7, 8), which are at least partially wood profiles which on the outwards facing sides are covered by weather-shielding covering members (11, 12, 15, 17, 20, 21, 32) for sealing enclosure of the subjacent wood profiles on all surfaces protruding from the roofing, said covering members being connected with the wood profiles by means of engagement and securing means (23-29, 40) which are designed in such manner and/or positioned such relative to the covering members that penetration of water and moisture into the wood profiles is substantially prevented, the covering members comprising a hood-like upper covering cap (32) for covering the top member (1, 5), an interior glazing profile (15) for covering a part facing the light-admitting area of the window of the upper edge (7, 8) of each sash side member, an exterior covering member (11) for covering the part protruding from the roofing of the exterior side of each frame side member (3, 4) and the adjoining part of the upper edge of the frame side member, and a cap member (20, 21) overlapping the glazing profile (15) and said covering member (11), the cap member being at the bottom secured to the lower part of the side member (7, 8), whereas at the top it is secured to the upper part of the side member (3, 4), characterized in that the cap member (20) at its upper end is retained by said upper covering cap (32) and at its lower end is integral with a bent, hidden engagement means (25, 26) for snapping engagement with an engagement means (24) secured at the lower end of the side member (7, 8).

2. A roof window according to claim 1, characterized

a c t e r i z e d in that the sash structure is accommodated as a pivot sash in a frame structure with top, bottom and side members (1 - 4) at least partially made of wood profiles, the hood-like upper covering cap 5 (32) covering the top members (1, 5) of the frame and sash structure, whereas the exterior covering member (11) covers the exterior side of each frame side member (3, 4) and the adjoining part of its upper edge.

3. A roof window according to claim 2, c h a r -
10 a c t e r i z e d in that the sash structure has a pivot axis (10) parallel with and approximately halfway between the top and bottom members (1, 2; 5, 6), and that said cap member comprises an upper and a lower cap member (20, 21) placed on either side of the pivot
15 axis, the upper cap member (20) being secured to the upper part of the frame side member (3, 4) or to an intermediate sash arm (36) connected between the frame and sash side members (3, 4; 7, 8), whereas the lower cap member (21) is secured to the lower part of the
20 sash side member, said cap members (20, 21) being at a short distance from the lower end of the upper cap member and the upper end of the lower cap member provided with securing means for being secured to fittings in fixed connection with the frame side
25 members (3, 4) or said intermediate sash arms, respectively, and with the sash side members (7, 8) outside the wood profiles thereof.

4. A roof window according to claim 1, 2 or 3, c h a r a c t e r i z e d in that the engagement means
30 at the lower end of the cap member (21) comprises an engagement bracket (25) parallel with the exterior wall (21a) of the cap member, said bracket being provided with a keyhole-shaped recess (26) for engagement with and securing of a pin member (27) fastened to the sash
35 side member (7, 8).

5. A roof window according to claim 3, c h a r -
a c t e r i z e d in that said securing means comprise
screw holes (28) in the exterior walls (20a, 21a) of
the cap members (20, 21) and in that said fittings are
5 screw fittings (30, 31) for screws (29).

6. A roof window according to claim 5, c h a r -
a c t e r i z e d in that said screw fittings (30, 31)
are connected with a swing fitting in connection with
the frame side member (3,4) or said intermediate sash
10 arm (36) and the sash side member (7,8), respectively.

7. A roof window according to one of the preceding
claims, c h a r a c t e r i z e d in that the cap
member (20, 21) is designed as a flat, trough-shaped
profile with U-shaped profile cross section comprising
15 an exterior wall (20a, 21a) and two low side walls
(20b-c, 21b-c) covering upright flange walls (15b, 11c)
on the glazing profile (15) and the exterior covering
member (11).

8. A roof window according to claims 3 and 7,
20 c h a r a c t e r i z e d in that the upper and the
lower cap members have the same profile cross section
and that the lower cap member (21) at its upper end has
a joggled connection member (22) inserted under the
lower end of the upper cap member (20), said connection
25 member having such a shape that the cap members (20,
21) in the closed position of the window are placed
with their exterior walls (20a, 21a) and side walls
(20b-c, 21b-c) in alignment with each other, and in
that the lower cap member (21), when the window is
30 opened, may swing unimpededly outwards relative to the
upper cap.

9. A roof window according to claim 8, c h a r -
a c t e r i z e d in that said joggled connection
member (22) on the lower cap member (21) against the
35 lower end of the upper cap member (20) forms a pressure

relieve chamber (22a) to prevent water penetration from below under the upper cap member (20).

10. A roof window according to claim 7, 8 or 9, characterized in that the cap member (21) at the bottom is provided with a bottom wall (21d) integrally connected with its side walls (21b-c).

11. A roof window according to claims 4 and 9, characterized in that said engagement bracket (25) is designed as a bent flange member in parallel with the exterior wall (21a) of the lower cap member (21), said flange member being connected with said bottom wall (21d).

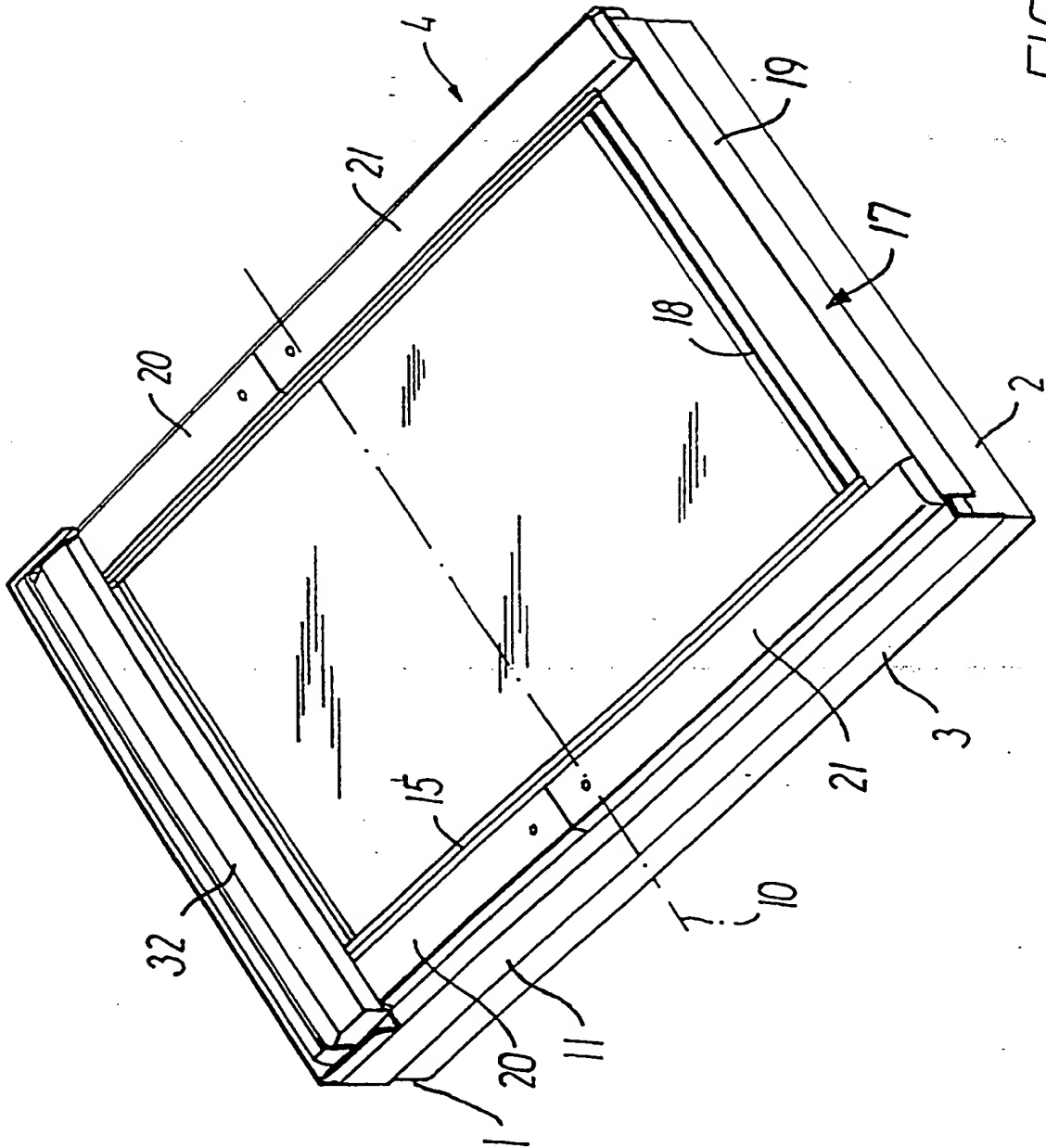
12. A roof window according to any of the preceding claims, characterized in that the exterior frame covering members (11) at their lowest ends are provided with engagement flanges (13) for sealing, positive locking engagement with protruding flange members (14) from the ends of an exterior frame covering member (12) for the frame bottom member (2).

13. A roof window according to claim 3, in which the sash structure (33) under normal use is accommodated as a top-hung pivot window with an axis of rotation at the frame and sash top members (1', 5'), whereas said pivot axis approximately halfway between the top and bottom members (1', 2'; 5', 6') is provided by pivotal connection of the sash side members (7', 8') to intermediate sash arms (36) with a view to making a turning of the window into a cleaning position possible, characterized in that the upper cap member (20') is secured to said intermediate sash arms (36), and that an upper covering member for the top members (1', 5') is made in two pieces with a lower part (38) connected with the intermediate sash and an upper part (39) connected with the frame top member (1').

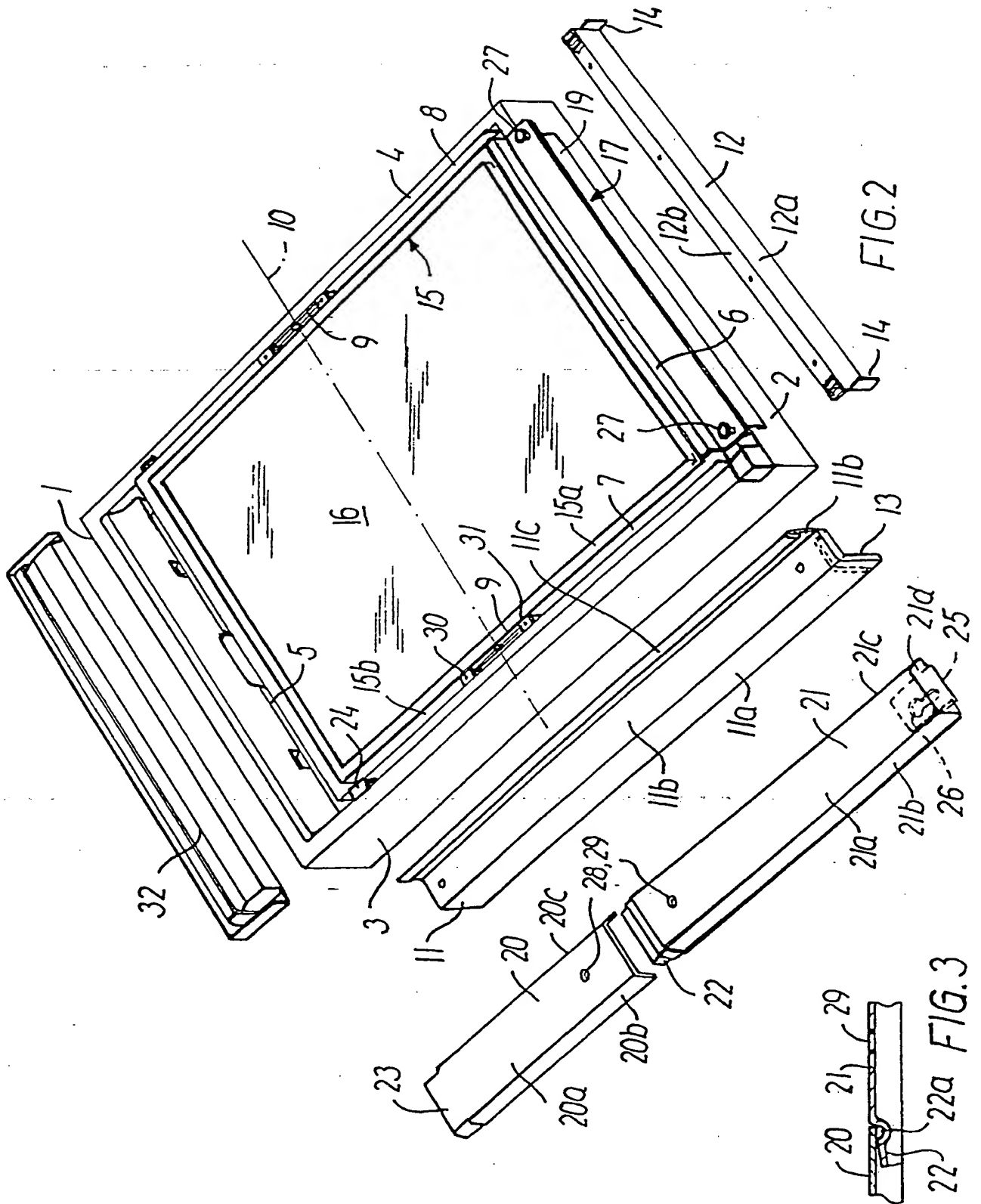
14. A roof window according to any of the preceding claims, characterized in that frame covering members (11) are secured to the frame structure (3, 4) by screw connections (29) screwed into 5 bearing bushings (40) of plastic material, said bushings being secured to the wood profiles of the frame structure (3, 4).

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FIG. 1



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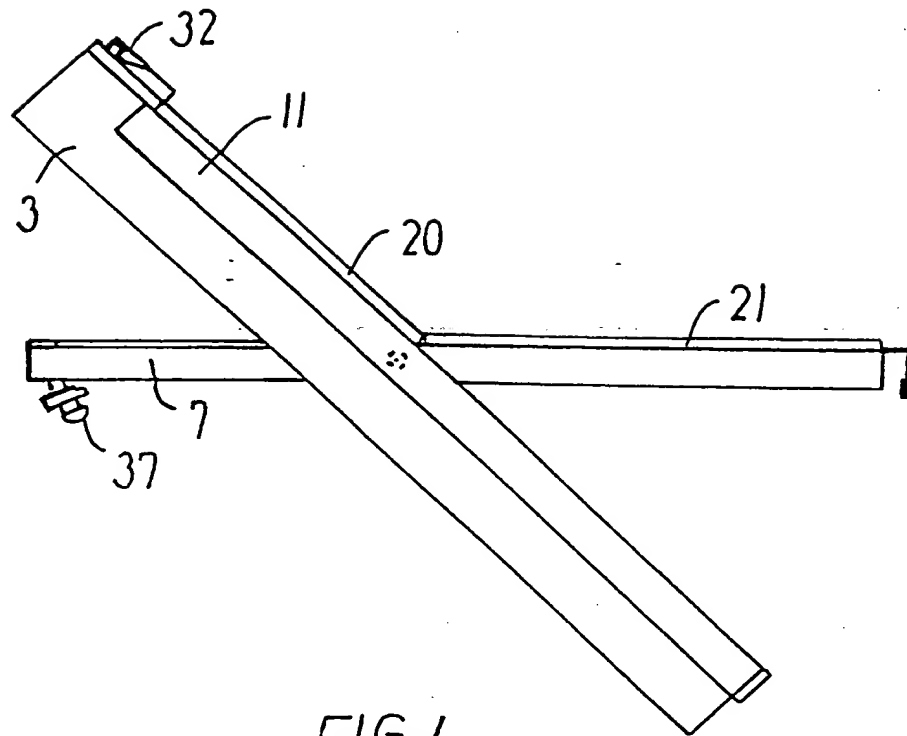


FIG. 4

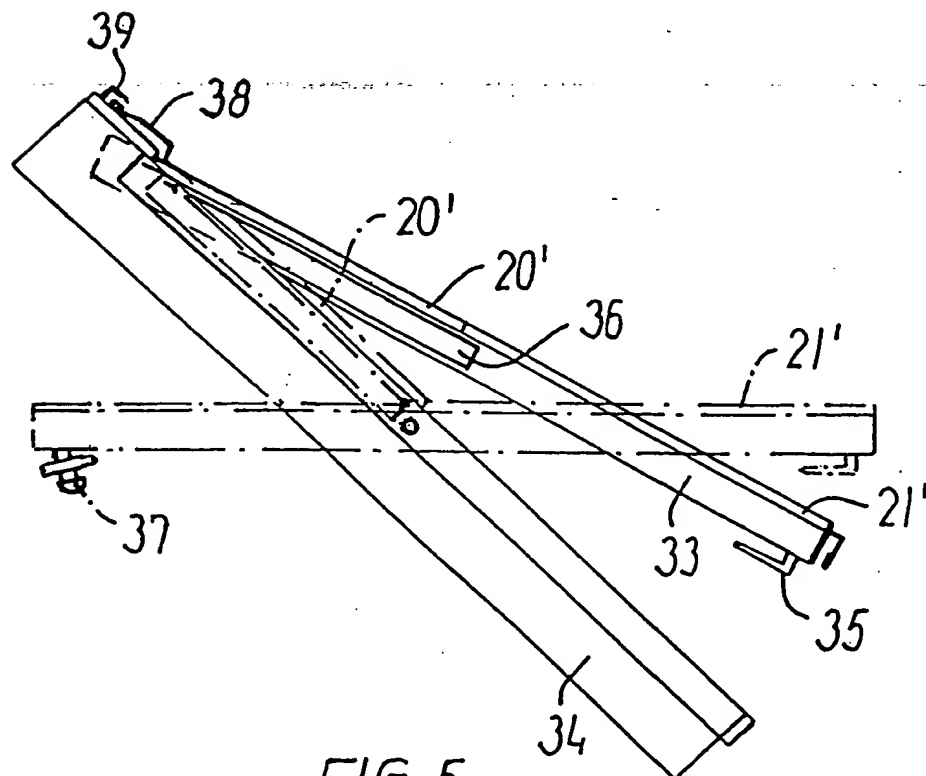


FIG. 5

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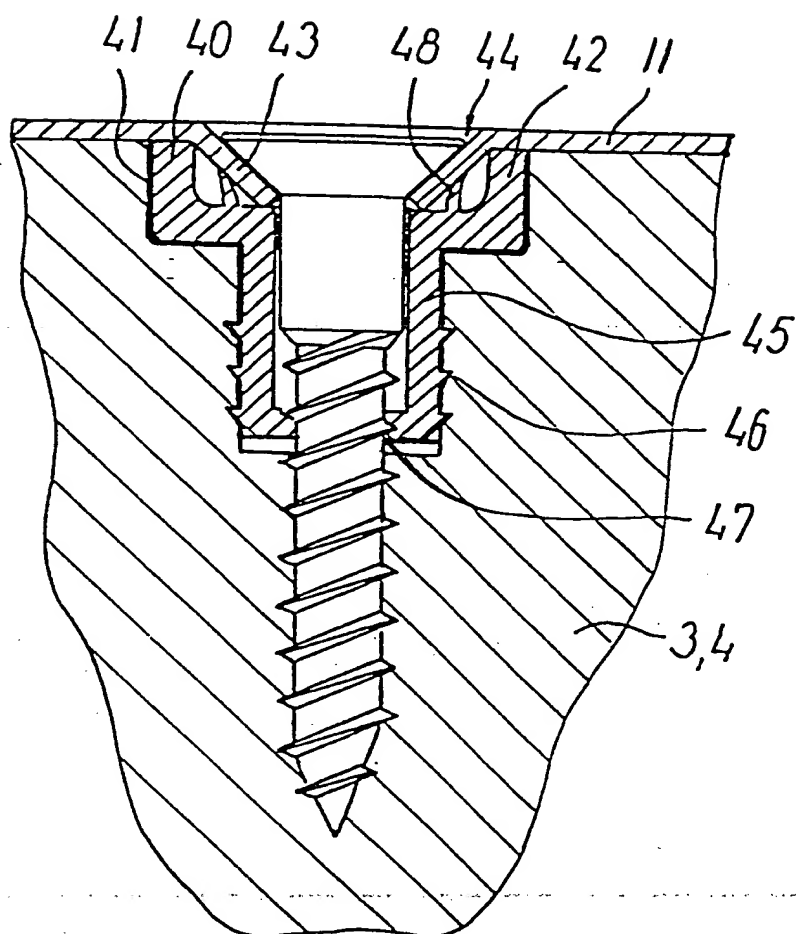


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 99/00169

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E04D 13/02, E06B 3/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: E06B, E04D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 2443098 A1 (A. SCHMIDT & CO., NÜZIDERS), 20 March 1975 (20.03.75), page 4 - page 5, figures 1-9 --	1-14
A	SE 374578 B (S A HÖGEDAL), 10 March 1975 (10.03.75), page 5, 2nd paragraph - 4th paragraph --	1-14
A	GB 2045844 A (CODE DESIGNS LIMITED), 5 November 1980 (05.11.80), figures 1-11, abstract	1-14
A	DE 2503519 A1 (BEIJER GMBH), 5 August 1976 (05.08.76), page 9, 1st paragraph, figures 1,4 --	1-14

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents

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- "&" document member of the same patent family

Date of the actual completion of the international search

22 June 1999

Date of mailing of the international search report

14 -07- 1999

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Anna Sandberg / MR
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT
Information on patent family members

01/06/99

International application No.

PCT/DK 99/00169

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				CH 590393 A	15/08/77
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